Remarks/Arguments

Applicants wish to thank the Examiner for the careful review of the claims, specification and drawings.

In response to the Office Action mailed July 31, 2006, no new claim has been added.

After entry of this amendment, claims 1- 27 are pending.

It is respectfully submitted that each and every feature recited in the amended specification and/or amended claims are fully supported in the specification as filed. No new subject matter has been added.

Rejections under 35 USC § 102(b)

The Office Action argues that claims 1, 2, 5 – 7, 10 – 12, and 23 – 27 are rejected under 35 USC § 102(b) as being anticipated by Blomgren et al. (U.S. Patent No. 5,884,057), hereinafter "Blomgren".

Claims 1, 2, 5 – 7, 10 – 12, 13 and 23 – 27

The Office Action argues that claims 1, 2, 5 – 7, 10 – 12, and 23 – 27 are rejected under 35 USC § 102(b) as being anticipated by Blomgren.

A rejection under 35 USC § 102 requires that the cited reference teaches all the claimed elements. (MPEP 706 and 2141 et seq.). That is, the prior art reference must disclose each element of the claimed invention "arranged as in the claim."

The Office Action argues that claims 1, 2, 5 – 7, 10 – 12, and 23 – 27 are rejected under 35 USC § 102(b) as being anticipated by Blomgren for various reasons. Blomgren is directed toward a dual-instruction set processor for processing integer and floating point instructions, wherein latency is reduced by emulating complex CISC instructions with software routines composed of simpler RISC instructions.

However, it is respectfully submitted that the current invention recites features not taught or suggested by the Blomgren, wherein the independent claim 1 is representative of independent claims, namely the claimed features as recited in independent claim 1:

1.   (Original) A method for testing floating point hardware in a processor while executing a computer program, comprising:

executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result;

executing said first floating point instruction utilizing said floating point hardware, thereby obtaining a hardware-generated result; and

comparing said emulated result with said hardware-generated result.

The features, in the manner claimed, in claim 1 requires "executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result".

The Office Action argues that this feature is taught by Blomgren:

"In a preferred embodiment, certain very complex CISC instructions are not directly supported in hardware but are emulated by software routines composed of simpler RISC instructions. CISC instruction decoder 32 detects these emulated instructions and signal an unknown opcode over line 40 to mode control logic 30. Mode control logic 30 then sets the RISC bit 60 in register 38 and load instruction pointer with the address of the emulated routine in memory. The RISC emulation routine executes, and performs the operation that the very complex CISC instruction would have performed. The last instruction of the emulation routine is a special extended RISC instruction causing mode register 38 to be reset to CISC mode and the instruction pointer updated to point to the following CISC instruction. The CISC program continues with the following instruction unaware that the instruction was emulated with RISC instructions." (col 6, line 61 – col 7, line 10).

Applicant respectfully traverses.

Blomgrem teaches the emulation of complex CISC instructions by software routines composed of simpler RISC instructions; however, the execution of the simpler RISC instructions does involve floating point hardware, as exemplified by:

> "The <u>floating point pipeline</u> 14 is aligned 3 stages and three clock periods later to integer pipeline 12 for CISC instructions than for RISC instructions. RISC instructions can produce their results as quickly as possible, while CISC instructions are delayed to allow fetching memory operands before the floating point operation is executed." (col 6, lines 25 – 30) [<u>underline</u> for emphasis].

> "RISC instructions that load or store floating point operands use integer pipeline 12, but read or write the floating point registers 20 rather than the integer general-purpose registers (GPR's) 24. <u>Floating point pipeline</u> 14 reads these floating point registers 20 during the F0 stage for register operands, and writes the result of the floating point operation back to floating point registers 20 during the last F5 stage." (col 7, lines 53 – 59) [<u>underline</u> for emphasis].

Therefore, the emulated results from the teaching of Blomgren allow complex CISC instructions to be sent to the floating point pipeline at the beginning of the integer pipeline as a set of simpler RISC instructions instead of the normal processing of CISC instructions sent to the floating point pipeline at the end of the integer pipeline. Blomgrem clearly teaches the use of floating point hardware for the execution of emulated, software routines of simpler RISC instructions.

Applicant respectfully asserts that the aforementioned teaching is distinctly different from the claim features, in the manner claimed. Applicants cannot find, in Blomgren, the aforementioned features.

Independent claims 1, 13 and 23 require the aforementioned features. These elements and features are not taught in the cited document, Blomgren. Consequently, Applicants submit that the rejection of independent claims 1 and 23 under 35 U.S.C. 102(b) be withdrawn.

Dependent claims 2, 5 – 7, 10 - 12 depend from independent claim 1 and require additional elements or features not taught or suggested by Blomgren.

Dependent claims 24 – 27 depend from independent claim 23 and require additional elements or features not taught or suggested by Blomgren.

For the aforementioned reasons and others, it is respectfully submitted that the pending claims are novel, non-obvious, and patentable over the cited art of record. The cited reference, Blomgren, does not teach the required elements in the manner claimed. Consequently, Applicants submit that the pending claims are allowable over the cited reference. Applicants therefore request that the rejection of claims 1, 2, 5 – 7, 10 – 12, and 23 – 27 under 35 U.S.C. § 102(b) be withdrawn.

No new subject matter has been added.

Rejections under 35 USC § 103(a)

The Office Action argues that claims 3, 4, 8, and 9 are rejected under 35 USC 103(a) as being unpatentable over Blomgren in view of Markstein et al. (U.S. PGPUB 20040158600) hereinafter "Markstein".

The Office Action argues that claims 13 – 22 are rejected under 35 USC 103(a) as being unpatentable over Blomgren in view of Van Dyke et al. (U.S. Patent No. 7,047,394) and further in view of Markstein, hereinafter "Van Dyke".

Claims 3, 4, 8, and 9

A rejection under 35 USC 103(a) requires that the combined references suggest the claimed combination. (MPEP 706 and 2141 et seq.). Under the Graham test, three factors must be evaluated: the scope and content of the prior art; the differences between the prior art and the claimed invention; and the level or ordinary skill in the art. (MPEP 706 and 2141 et seq.).

The Office Action argues that claims 3, 4, 8, and 9 are rejected under 35 USC § 103(a) as being unpatentable over Blomgren in view of Markstein for various reasons.

However, for the previously stated reasons, since independent claim 1 should now be allowable, dependent claims 3, 4, 8, and 9 which incorporates independent claim 1 by reference should also be allowable. Alternatively or additionally, dependent claims 3, 4,

8, and 9 are novel, nonobvious, and patentable due to its independent recitations of independently patentable features.

No new subject matter has been added.

Claims 13 - 22

A rejection under 35 USC 103(a) requires that the combined references suggest the claimed combination. (MPEP 706 and 2141 et seq.). Under the Graham test, three factors must be evaluated: the scope and content of the prior art; the differences between the prior art and the claimed invention; and the level or ordinary skill in the art. (MPEP 706 and 2141 et seq.).

The Office Action argues that claims 13 - 22 are rejected under 35 USC § 103(a) as being unpatentable over Blomgren in view of Van Dyke and further in view of Markstein for various reasons.

However, for the previously stated reasons, since independent claim 1 should now be allowable, independent claim 13 which claims similar features as independent claim 1 should also be allowable. Alternatively or additionally, independent claim 13 is novel, nonobvious, and patentable due to its independent recitations of independently patentable features.

For the aforementioned reasons, since independent claim 13 should now be allowable, dependent claims 14 - 22 which incorporates independent claim 13 by reference should also be allowable. Alternatively or additionally, dependent claims 14 - 22 are novel, nonobvious, and patentable due to its independent recitations of independently patentable features.

No new subject matter has been added.

Conclusion

In view of the discussion herein, Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at 408-257-5500.

If any petition is required to facilitate the entry of the present amendment, please consider this communication a petition therefore as well. A three-month extension of time is petitioned herewith and a check for the 3-month extension fees is enclosed. The Commissioner is authorized to charge any fees beyond the amount enclosed which may be required, or to credit any overpayment, to Deposit Account No. 50-2284 (Order No. HPCQ-P049/200314830-1).

Respectfully submitted,

/Joseph A. Nguyen/ #37,899

Joseph A. Nguyen